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NOTES ON MYXOMYCETES FROM EASTERN MASSACHUSETTS.

FRANK A. GILBERT.

THE *Myxomycetes*, or Slime Moulds as they are more commonly called, are a compact group of very interesting organisms whose exact status in the organic world has been the subject of considerable debate. Resembling members of the lowest animal phylum during part of their life, they have been claimed by the zoölogist, notwithstanding the fact that during the remainder of their life, their habits and characteristics are entirely those of plants. This debate has never been settled and so the *Myxomycetes* are rather apologetically included in both plant and animal classifications. Because of their small size and secluded habitats, the *Myxomycetes* are never conspicuous and remain in comparative obscurity, scarcely noticed by the average botanist, neglected by the zoölogist, but a source of keen interest and pleasure to a student of the group.

This article does not pretend to give a complete list of the *Myxomycetes* that occur in this region. MacBride's *North American Slime Moulds* should be consulted in that regard. However, MacBride's monograph, covering the *Myxomycetes* of an entire continent naturally does not give much local information upon the species found in a small area. Details of this sort must be taken up in local floras or in special articles, and it is the purpose of this paper to show, in general, the species that may be found here, with notes as to their habitats and abundance. Although many articles have appeared concerning the phanerogamic flora of eastern Massachusetts, little is known of our local cryptogamic flora and the only previous work

on the *Myxomycetes* of this region, that has come to the writer's attention, is in *The Bulletin of the Bussey Institution* for 1876. Here Dr. W. G. Farlow gives a preliminary list of Fungi found in the "vicinity" of Boston and includes twenty-six *Myxomycetes*, of which three were collected at Eastport, Maine.

Nearly all of the collections given below were made by the writer and most of them during the summer and fall of 1926, although a few were gathered in the two preceding years. With the exception of a number of sets of duplicates for distribution, all specimens are in his herbarium. He is greatly indebted to Dr. William C. Sturgis and Miss Gulielma Lister for determinations of the more difficult species.

CERATIOMYXA FRUTICULOSA (Muell.) Macbr. Exceedingly common on fallen logs and other decaying wood from late spring to about the middle of August. Quite often this species appears in the laboratory upon the substratum of rotten wood used to cultivate the plasmodia of other *Myxomycetes*. As the plasmodium of *Ceratiomyxa* is nearly hyaline, and does not creep over the surface of the wood, its presence is not suspected until it begins to emerge from the substratum and erect its white sporophores. Specimens were collected from Pepperell, Dunstable, Gloucester, and Canton.

CERATIOMYXA FRUTICULOSA (Muell.) Macbr. var. *PORIOIDES* Lister. (*Ceratium porioides* A. & S.) Reported from Woods Hole by Farlow but specimen not found by the writer.

BADHAMIA AFFINIS Rost. One rather meager specimen was collected from the bark of a stick, on an old wood pile at Manchester.

BADHAMIA LILACINA (Fr.) Rost. Very common throughout the summer and fall. *B. lilacina* is usually confined to swamps, often occurring in large clusters partway up the fronds of *Onoclea sensibilis* and other ferns, or upon grass and leaves. Collections were made from Dunstable, Pepperell, Gloucester, Boxford, Lincoln, Rockport, and Canton.

BADHAMIA MAGNA Peck. Although the writer has a number of specimens from the vicinity of Boston in his herbarium, he has made but one collection of this species himself. This was on the bark of dead *Acer rubrum*, five feet from the ground, at Lincoln.

BADHAMIA RUBIGINOSA (Chev.) Rost. Common in the fall. Specimens were collected on fallen twigs at Hubbardston, Dunstable, and Gloucester, and on decaying *Castanea* bark at Groton.

PHYSARUM CINEREUM (Batsch) Pers. This cosmopolitan species was collected a number of times from Pepperell and Dunstable.

PHYSARUM COMPRESSUM Alb. & Schw. On old cornstalks from rubbish heap; Canton.

PHYSARUM CONFERTUM Macbr. On fallen leaves; Canton.

PHYSARUM CONNATUM Lister. Considerable material was collected on and around pilei of *Polyporus hirsutus* on *Populus* logs, at Pepperell Springs. *Stemonitis fusca* var. *rufescens* and *Trichia persimilis* were collected at different times during the season from the same logs.

PHYSARUM GLOBULIFERUM (Bull.) Pers. On dead wood; Canton.

PHYSARUM LATERITIUM (Berk. & Br.) Rost. Collected twice on dead twigs in swamp; Dunstable.

PHYSARUM LEUCOPUS Link. This species, which is reported as rare in North America by MacBride, was collected on leaves and twigs in a swamp at Dunstable.

PHYSARUM NUTANS Pers. This species although common in North America, was collected but once, at Lincoln.

PHYSARUM SERPULA Morgan. Two collections of this uncommon species were obtained on leaves and twigs in swamps at Dunstable. Miss Lister, in a letter to the writer, says that there has been but one previous report of this species from eastern United States, in recent years.

PHYSARUM SINUOSUM (Bull.) Weinm. One of the most common species during the late summer, occurring on grass and twigs in swamps or on nearly any grassy compost heap. Collections were made from Pepperell, Dunstable, Boxford, Lincoln, Rockport, and Gloucester.

PHYSARUM VIRESCENS Ditm. On moss; Dunstable.

PHYSARUM VIRESCENS Ditm. var. **NITENS** Lister. On dead leaves in swamp; Dunstable.

PHYSARUM VIRIDE Pers. Very common throughout the summer and early fall. Collected from Canton, Dunstable, Pepperell, Boxford, and Lincoln.

PHYSARUM VIRIDE Pers. var. **AURANTIUM** Lister. This orange colored variety was not very common but forms connecting it with the species were frequent as were grayish forms which might be included under the following variety; Dunstable.

PHYSARUM VIRIDE Pers. var. **INCANUM** Lister. Canton and Dunstable.

FULIGO SEPTICA (L.) Gmel. MacBride divides this species into a number of forms, two of which are common. The one most frequently found is form **OVATA**, with a brown or yellowish, foamy crust. It occurs until late summer around stumps and dead trees, especially of Apple and may be found even in very dry situations. It was collected at Pepperell and Gloucester but was noted at a number of other places. The form **LAEVIS** with a firmer and more persistent crust was collected at Dunstable and Leverett. The plasmodium of this form is white in contrast to that of the form **OVATA** which is yellow.

FULIGO SEPTICA (L.) Gmel. var. **CANDIDA** R. Fries. On *Acer rubrum* stump; Lexington.

CRATERIUM LEUCOCEPHALUM (Pers.) Ditm. This species appeared very plentifully on the shredded inner bark of a *Populus* log at Pepperell Springs.

CRATERIUM MINUTUM (Leers) Fr. Collected twice; on bark at Canton and on dead leaves at Pepperell.

LEOCARPUS FRAGILIS (Dicks.) Rost. Very common. It nearly always was found fruiting on the stems and twigs of living bushes at from six inches to five feet from the ground. Specimens were collected at Hubbardston, Dunstable, Pepperell, Lincoln, and Gloucester.

DIDERMA GLOBOSUM Pers. On leaves and trash at base of bushes; Dunstable and Leverett.

DIDERMA HEMISPHERICUM (Bull.) Horne. This rather rare species was collected on leaves and twigs in swamps, at Dunstable and Pepperell.

DIDERMA SIMPLEX (Schroet.) Lister. This species which is reported by MacBride to be rare in North America was collected once, on bark at Lincoln.

DIDERMA TESTACEUM (Schrad.) Pers. This species occurs quite commonly in conjunction with *Physarum sinuosum* and *Diachaea leucopoda* in grassy but more or less shaded swamps. During July and August there is scarcely a grassy swamp that does not contain one or all of these species in profusion. Specimens were collected at Pepperell, Dunstable, Boxford, and Lincoln.

DIDERMA EFFUSUM (Schw.) Morg. Occasional in wooded swamps throughout the summer. Considerable material was collected at Dunstable.

DIACHAEA BULBILLOSA (Berk. & Br.) Lister. One collection was made at Dunstable.

DIACHAEA LEUCOPODA (Bull.) Rost. This species was very common in grassy swamps during the summer. It was also found a number of times covering the stems and leaves of low or creeping herbaceous plants in damp woods. Specimens were collected at Pepperell, Dunstable, and Hubbardston.

DIACHAEA SUBSESSILIS Pk. This rare species was found but once; in a swamp at Pepperell.

DIDYMIUM CLAVUS (Alb. & Schw.) Rabh. Reported from Forest Hills by Farlow but specimen not found by the writer.

DIDYMIUM NIGRIPES (Link) Fr. This species occurred on dead leaves in a swamp at Dunstable.

DIDYMIUM NIGRIPES (Link) Fr. var. XANTHOPUS Lister. This was perhaps the most common form collected, occurring in profusion in practically every swamp visited. Collections were made at Canton, Hubbardston, and Dunstable.

DIDYMIUM SQUAMULOSUM (Alb. & Schw.) Fr. On leaves in swamp; Dunstable and Pepperell.

MUCILAGO SPONGIOSA (Leyss.) Morg. Aethalia of this species completely covered the stems and lower branches of a currant bush growing by the roadside at Dunstable.

STEMONITIS FERRUGINEA Ehr. Common on logs, especially *Populus*. Specimens were collected from Pepperell and Gloucester.

STEMONITIS FUSCA (Roth) Rost. Typical *Stemonitis fusca* was collected at Dunstable and Boxford. In a number of cases specimens were taken, in which the capillital net was undoubtedly that of this species but the delicately reticulated spores were smaller and the whole sporangium was of a lighter color. This form was referred to the following variety. Forms were found also that could not be placed definitely in any one species but combined the characteristics of two or more. They were referred to the one that they most nearly resembled.

STEMONITIS FUSCA (Roth) Rost. var. RUFESCENS Lister. Collected at Pepperell, Gloucester, and Winchester.

STEMONITIS FUSCA (Roth) Rost. var. NIGRESCENS Torr. Collected but once, on decaying wood at Dunstable.

STEMONITIS HERBATICA Peck. Collected a number of times at Canton.

STEMONITIS HYPEROPTA Meyl. Collected on bark of *Populus* and other deciduous trees; Pepperell and Gloucester.

STEMONITIS SPLENDENS Rost. Collected at Waverley and Pepperell.

STEMONITIS SPLENDENS Rost. var. FLACCIDA Lister. This variety was found covering about six square inches of bark on an old stump of *Pinus Strobus*, at Dunstable.

COMATRICHA ELEGANS (Racib.) Lister. Collected once at Canton.

COMATRICHA IRREGULARIS Rex. Collected at Pepperell on the inner bark of *Populus*, and at Lincoln on *Acer*.

COMATRICHA NIGRA (Pers.) Schroet. Collected at Manchester on *Acer* logs, and at West Roxbury on the stump of some deciduous tree, the identity of which was not established.

COMATRICHA TYPHOIDES (Bull.) Rost. Common. Collections were made from Pepperell, Dunstable, and Salisbury. The latter collection was made from sporangia that covered a fair sized rotten stump, hidden among ferns.

LAMPRODERMA ARCYRIONEMA Rost. Collected on *Populus* at Pepperell.

LAMPRODERMA COLUMBINUM (Pers.) Rost. One good sized collection was gathered on a partly decorticated *Acer* log at Rockport.

CRIBRARIA MICROCARPA (Schrad.) Pers. On rotten wood; Pepperell and Canton.

CRIBRARIA PIRIFORMIS Schrad. On *Chamaecyparis* bark; Milton.

CRIBRARIA RUFA (Roth) Rost. Hubbardston and Beverly. The latter gathering was from *Tsuga* bark.

CRIBRARIA TENELLA Schrad. This species was found in profusion on rotten logs of an old wood pile at Pepperell.

CRIBRARIA TENELLA Schrad. var. CONCINNA G. Lister. Collected twice at Canton.

CRIBRARIA VIOLACEA Rex. This rare species was found once, at Canton.

CRIBRARIA VULGARIS Schrad. Reported from Newton by Farlow but specimen not found by the writer.

DICTYDIUM CANCELLATUM (Batsch) Macbr. This species is found occasionally throughout the summer and wherever it occurs seems to be present in large quantities. On one occasion it was found covering the entire lower half of a fence post in a damp pasture. Collections were made from Pepperell and Dunstable.

LICEA MINIMA Fr. On rotten pine board; Canton.

TUBIFERA FERRUGINOSA (Batsch) Gmel. Very common, especially in the fall. Specimens were collected at Pepperell, Milton, Boxford, Leverett, Wenham, Belmont, and Canton.

DICTYDIAETHALIUM PLUMBEUM (Schum.) Rost. The aethalia of this species do not appear in great numbers in one locality. Five aethalia were collected on logs at Wenham, Rockport, and Leverett.

RETICULARIA LYCOPERDON (Bull.) Rost. This not uncommon but localized species appears each spring upon dead trees at Cambridge. It was also collected in the same vicinity in the fall of 1924. Other collections are from Pepperell and Dunstable.

ENTERIDIUM ROZEANUM (Rost.) Wing. This species, very common in eastern Massachusetts, has been collected from nearly every locality visited. It usually occurs on decorticated branches and often is infested with larvae before it is completely dried out.

LYCOGALA EPIDENDRUM (Buxb.) Fr. This is one of the most common and conspicuous of Myxomycetes and is quite commonly collected by the novice who takes it for a puffball because of its superficial similarity to certain members of that group. It may occur in nearly any favorable situation but is especially frequent on old pine stumps. Collections were made at almost every locality visited.

LYCOGALA FLAVO-FUSCUM (Ehr.) Rost. Quite in contrast to the preceding species, *Lycogala flavo-fuscum* is quite rare. One collection has been made at Wenham. The single large aethalium was found about five feet from the ground on a dead stump of *Acer rubrum*.

TRICHIA AFFINIS DeBary. This species is very close to *Trichia persimilis* with which it is united by Professor MacBride. Since the specific difference depends upon the degree of completeness of the reticulation on the spores and as this varies considerably even in one gathering, one scarcely knows where to draw the line between species. The extreme form with a perfect reticulation is comparatively rare in comparison with intermediate forms, and has been collected only at Dunstable.

TRICHIA CONTORTA (Ditm.) Rost. Collected a number of times on bark, at Dunstable.

TRICHIA CONTORTA (Ditm.) Rost. var. INCONSPICUA Lister. Collected on bark, especially of *Populus*; Dunstable, Boxford, West Roxbury, and Leverett.

TRICHIA DECIPIENS (Pers.) Macbr. On bark; Dunstable.

TRICHIA FAVOGINEA (Batsch) Pers. On under side of rotten *Populus* log; Pepperell.

TRICHIA FLORIFORMIS (Lev.) G. Lister. On decaying *Ulmus* log, Belmont. The log upon which the specimens were found had on it, in addition: *Arcyria stipata*, *Arcyria pomiformis*, *Trichia persimilis*, *Arcyria denudata*, *Lycogala epidendrum*, and *Hemitrichia clavata*.

TRICHIA PERSIMILIS Karst. Typical specimens of this species were found only occasionally, but intermediate forms between *T. affinis* and *T. persimilis*, are included here and are very common, growing on rotting logs of all kinds, especially those of *Populus*. Collections were made at Dunstable, Pepperell, Canton, Lincoln, Milton, Belmont, and Hubbardston.

TRICHIA SCABRA Rost. Collected at Boxford, Dunstable, and Wenham. The Dunstable specimen was found on a rotten *Acer* log, the entire colony covering an area of approximately eight square inches.

TRICHIA VARIA (Pers.) Rost. On wood and bark; Lincoln, Boxford, Pepperell Springs, and Leverett.

OLIGONEMA FLAVIDUM (Peck) Mass. Small and scattered colonies were collected on fallen logs at Pepperell Springs.

HEMITRICHIA CLAVATA (Pers.) Rost. This species is very common and has been collected from nearly every locality visited. Often this species appears in such abundance as to cover the entire under side of a log.

HEMITRICHIA SERPULA (Scop.) Rost. This species although common was not found in great abundance. Specimens were collected from Pepperell, Canton, West Roxbury, and Boxford.

HEMITRICHIA VESPARIUM (Batsch) Macbr. Very common. It has been collected from nearly every locality visited. The sporangia in different specimens vary in color from a shining black to a dull reddish brown.

ARCYRIA CINEREA (Bull.) Pers. This species has been collected from Canton and Pepperell. In the latter place it was found on *Betula*. It is common on various wood substrata in laboratory cultures.

ARCYRIA DENUDATA (L.) Wett. Very common. This species is present everywhere on logs and decaying wood throughout the greater part of the year. It is rather conspicuous and with the exception of *Lycogala epidendrum* is probably the best known species. Collections have been made from nearly every locality visited.

ARCYRIA GLOBOSA Schw. (*Lachnobolus globosus* Rost.) Specimen collected by Farlow at Newton, in the Farlow Herbarium.

ARCYRIA INCARNATA Pers. Collected at Rockport on *Salix*, and at Lincoln on decorticated *Acer*.

ARCYRIA NUTANS (Bull.) Grev. Common. Specimens have been collected at Canton, Gloucester, and Boxford.

ARCYRIA OCCIDENTALIS (Macbr.) Lister. This rather rare species was collected at Dunstable and Leverett.

ARCYRIA OERSTEDTII Rost. This uncommon species has been collected but once, at Boxford.

ARCYRIA POMIFORMIS (Leers) Rost. Common. The scattered sporangia occur frequently on dead pine bark. Collections have been made at Canton, Belmont, Pepperell, Dunstable, and Milton.

ARCYRIA STIPATA (Schw.) Lister. Common. The crowded sporangia are either copper colored or rosy, specimens of the latter shade appearing to be more frequent. Collections have been made at Belmont, Canton, Pepperell, Dunstable, Leverett, Boxford, Lincoln, and Milton.

LACHNOBOLUS CONGESTUS (Somm.) Lister. While collecting at Boxford, the writer came across a fallen down woodpile which being in a more or less advanced stage of decay yielded a number of excellent specimens, among which was a very small fragment of a *Trichia* like form, quite unfamiliar. Upon examining this in the laboratory, it was found to agree with the description of *Lachnobolus congestus* but since this species as far as was known had never been reported from North America, a portion was sent, along with a few other uncommon species, to Miss Lister for verification. She answered that it was indeed *Lachnobolus congestus* and had been collected but once before on this continent, in Colorado by Dr. Sturgis. It is therefore new to eastern United States, but undoubtedly intensive collecting will prove that this species, formerly regarded as European, is widespread if infrequent in this country.

PERICHAENA CHRYSOSPERMA Lister. This inconspicuous species has been collected but once, on bark at Wenham.

PERICHAENA DEPRESSA Lib. Not common. Collected from Dunstable, Boxford, and Lincoln.

DISCUSSION

Of the twenty-nine genera and ninety-three species mentioned in this paper only *Physarum lateritium*, *Physarum leucopus*, *Physarum serpula*, *Diderma hemisphericum*, *Diderma simplex*, *Diachaea subsessilis*, *Comatricha elegans*, *Cribraria violacea*, *Arcyria occidentalis*, and *Lachnobolus congestus* can be considered rare enough to be of special interest. The collections of *Physarum serpula* and *Lachnobolus congestus* are especially noteworthy for it is but the second time that *Physarum serpula* has been collected in eastern North America in recent years, and the second time that *Lachnobolus congestus* has been found on this continent.

About thirty-five species may be said to be common and eighteen or twenty to occur in profusion. A person collecting *Myxomycetes* in the region could, during the course of a few months, hardly miss *Ceratiomyxa fruticulosa*, *Physarum sinuosum*, *Physarum viride*,

Fuligo septica, *Leocarpus fragilis*, *Diderma testaceum*, *Didymium nigripes* var. *xanthopus*, *Enteridium Rozeanum*, *Lycogala epidendrum*, *Trichia persimilis*, *Hemitrichia clavata*, *Hemitrichia vesparium*, and *Arcyria denudata*. Some species such as *Craterium leucocephalum*, *Mucilago spongiosa*, and *Dictydium cancellatum* while not ubiquitous, when found are present in large amounts, while on the contrary a few species such as *Reticularia lycoperdon* and *Dictydiaethalium plumbeum* although fairly common are not found in any great quantity where they do occur.

As a result of the writer's collections it seems clear that eastern Massachusetts is not especially outstanding with regard to its myxomycetous flora, but does yield rather varied and interesting collections if worked intensively, for the eighty-nine species and varieties mentioned in this paper represent nearly one fourth of the total number of species and varieties of *Myxomycetes* known to science. It seems probable that the extent of the foregoing list is the result, not of any special abundance of *Myxomycetes* in eastern Massachusetts but rather of the particularly intensive collecting that was done. Undoubtedly also, this list could be considerably augmented by collecting in the same area another year, for *Myxomycetes*, unlike most fungi, do not necessarily appear in the same vicinity season after season but often are found only at more or less rare intervals.

LABORATORIES OF CRYPTOGAMIC BOTANY, Harvard University,
Cambridge, Mass.

CONTRIBUTION TO THE FLORA OF THE ISLANDS OF ST. PIERRE ET MIQUELON.

BRO. LOUIS ARSÈNE.

(Continued from p. 158.)

**CHENOPODIUM ALBUM* L.—Introduced in gardens and fields; C. Miquelon Village, August 16, 1900.

Bonnet and Delamare report the related species, *Chenopodium opulifolium* Schrader, which is perhaps only a variety of *Ch. album*.

Delamare says *CHENOPODIUM RUBRUM* is also introduced as a weed in gardens; I did not meet with it there. But it grows in the salt marshes near the Grand Barachois of Miquelon, where it certainly is native.